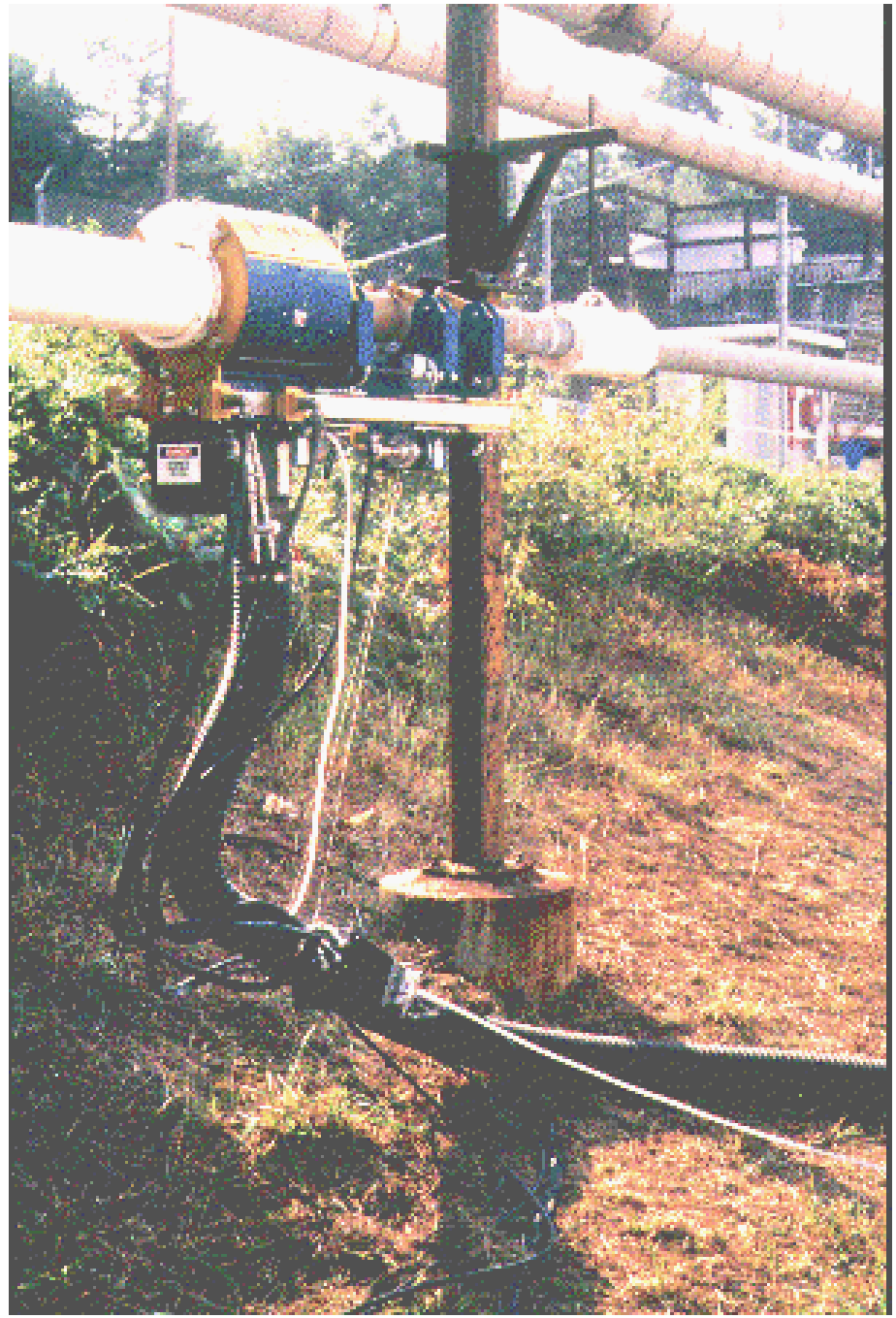
BOA:
Asbestos Pipe-Insulation Abatement Robot

- **PROJECT GOAL**
  - Automated Asbestos Pipe-Insulation Abatement Robot & Support System for remote and minimally manually-attended abatement tasks
- **TECHNICAL APPROACH**
  - Remote and automatic self-propelled travelling mini-enclosure
  - In-situ cutting, water-blasting, encapsulation and drying under high-speed airflow-induced vacuum
  - Off-board water-separation (recycled & reused), waste/solids centrifuging and bagging and airflow HEPA-filtering
- **WORK SCOPE**
  - Proof-of-concept demonstration: CMU - WI/SP ‘95/’96
  - Cost-Benefit Study Development: CMU - SU’96
  - Develop 4-inch prototype and demonstrate on surrogate: K-25 - SU’98
  - Modify prototype for ruggedness and 3-inch pipe: CMU - WI’98
  - Demonstration at DoE site on asbestos: TBD - WI’98 to SU’99



Technology Overview

- ***TECHNOLOGY MATURITY***
  - ***Competing Baseline***
    - ***Glovebagging***
    - ***Full-enclosure abatement***
  - ***Technology Maturity***
    - ***SDG Level 5 (completed); awaiting OK to go to Level 6***

- ***TECHNOLOGY RELEVANCE***
    - ***Aligned with STCG at INEEL: ID-7.2.11***
      - ***INEEL seeking appropriate demo-site***
      - ***Awaiting go/no-go decision from INEEL***
    - ***Broadly applicable across the DoE complex; No takers yet though!***
    - ***Aligned with NIBS demonstration-cycle; Likely demo at Pentagon???***

System Performance

- ***SYSTEM CAPABILITY***
  - ***Increased Abatement Rates up to 20 - 30 feet/hour***
  - ***OSHA Alternate Method Allowance Issued - 1997***
  - ***Fiber-count verification below EPA and OSHA PEL & TWA limits***
- ***POTENTIAL & BENEFITS***
  - ***Job-cost reduction of 25% (glovebagging) to 50% (full enclosure) compared to manual techniques***
  - ***Dose-reduction to to operator removal from abatement-site by up to 100'***
  - ***Reduced fatigure from lack of heat-exhaustion***
  - ***Waste-volume reduction by more than 60% due to inherent size-cuts***
  - ***Application to on-going DoE and commercial abatement jobs***
  - ***Applicability to 3" & 4" pipe-diameter (current) and larger (future)***

Technical Progress

- ***SCHEDULE & TIMING***
  - Project Duration: November 1994 to June 1999
  - Total Funding: $2,291K
- ***STATUS***
  - Demonstration of system at on-going DoE (K-25) or commercial nuclear abatement site completed in August 1998
  - Prototype hardening and modification for simultaneous 3-inch pipe handling completed in December 1998
  - Awaiting asbestos-abatement site-selection for final demonstration…..
  - Teamed with IUOE and NIBS for training and regulatory demonstration - demonstration site-selection and notification pending (Feb.’99)
  - Attempting to partner with commercial abaters for non-DOE demo (since Jan.’99)